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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,706	06/04/2001	Sridhar Gollamudi	3	4965
46290	7590	03/16/2005		
WILLIAMS, MORGAN & AMERSON/LUCENT 10333 RICHMOND, SUITE 1100 HOUSTON, TX 77042			EXAMINER PERILLA, JASON M	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/873,706

Applicant(s)

GOLLAMUDI, SRIDHAR

Examiner

Jason M Perilla

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-13 are pending in the instant application.

Drawings

2. The drawings are objected to because the application lacks a clearly legible set of drawings. The Examiner notes that the block diagram of figure 2 has words that are nearly illegible in blocks 86 and 88. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Arguments/Amendments

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3. The objections to the claims have been withdrawn in view of the amendments to the claims and the Applicant's remarks filed November 16, 2004.

4. Applicant's arguments, see pages 2 and 3 of the remarks, filed November 16, 2004, with respect to the rejection of claims 4 and 5 under 35 U.S.C. § 112, second paragraph, have been fully considered and are persuasive. The rejections of claims 4 and 5 under 35 U.S.C. § 112, second paragraph have been withdrawn.

5. Applicant's arguments filed November 16, 2004 with respect to the prior art rejections of claims 1-13 (see pages 3 et seq.) have been fully considered but they are not persuasive.

The Applicant's argument against the prior art rejections of all claims 1-13 set forth in the office action of August 18, 2004 are based upon an alleged lack of disclosure regarding the claim limitation of determining at least one correlation coefficient between received signals from at least two antennae. However, the Examiner asserts that the prior art rejections set forth August 18, 2004 including at least Harrison (US 6154485) disclose determining at least one correlation coefficient between received signals from at least two antennae. Furthermore, the Examiner insists that the limitation was clearly met in the office action. The rejection of claim 1 previously set forth in the first office action includes:

"Further, the adaptive array filter weights 90 and 92 [correlation coefficient] of figure 1 are calculated **between received signals from the at least two antenna in response to channel feedback from the receiver** (fig. 1, ref. 149; col. 5, line 65-col. 6, line 6)."

Harrison discloses in column 5, line 65 – column 6, line 6:

"Thus, the process should be understood as a continuous process implemented in base transmitter 52, wherein traffic channel data **is continuously received**

into the transmitter along with measurements and calculations needed to compute adaptive array weights 90 and 92 [the correlation coefficient]..."

Further, the Examiner hereby cites column 4, lines 28-38 of Harrison:

"In order to support an adaptive array mode in base transmitter 52, subscriber unit 56 includes channel measurement and feedback processor 149. Channel measurement and feedback processor 149 measures the characteristics of channels 108 and 110, which together may be referred to as a composite channel between base transmitter 52 and subscriber unit 56, and then appropriately formats messages to send back to a base receiver. The information contained in such messages are used to determine ... calculating the values of V_0 and V_1 . [the correlation coefficient]"

Thereby, Harrison plainly discloses that the channel measurement and feedback processor (fig. 1, ref. 149) in the receiver (fig. 1, ref. 56) returns channel information to the transmitter (fig. 1, ref. 52) which is used to update or compute the adaptive array weights or correlation coefficient.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2, 5, and 6-13 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Harrison (US 6154485 – cited in IDS).

Regarding claim 1, Harrison discloses a method of transmitting signals from at least two antennae (fig. 1; refs. 112, and 118) comprising the steps of: determining at least one correlation coefficient (α ; col. 7, lines 50-52) between received signals from

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the at least two antennae (fig. 1, refs. 116 and 118; col. 5, line 65-col. 6, line 6); and in response to the at least one determined correlation coefficient selecting at least one of orthogonal coding and beamforming for transmitting signals using the at least two antennae (fig. 5; col. 8, lines 4-35). The adaptive beamforming correlation coefficient α utilized in figure 5 is the equivalent to the adaptive array filter weights 90 and 92 which are utilized in the embodiment of figure 1. Further, the adaptive array filter weights 90 and 92 of figure 1 are calculated between received signals from the at least two antenna in response to channel feedback from the receiver (fig. 1, ref. 149; col. 5, line 65-col. 6, line 6).

Regarding claim 2, Harrison discloses the limitations of claim 1 as applied above. Further, Harrison discloses that the step of determining at least one correlation coefficient between the received signals comprises determining at least one amplitude correlation coefficient (fig. 5). The coefficient α of figure 5 determines the amplitude correlation of the various input signals for transmission (fig. 5, refs. 72 and 74) to the various antenna by the weight multipliers (fig. 5, refs. 172 and 176) by the function $(1-\alpha^2)^{1/2}$. Therefore, the correlation coefficient determines at least one amplitude correlation coefficient.

Regarding claim 5, Harrison discloses the limitations of claim 1 as applied above. Further, as broadly as claimed, Harrison discloses that the step of determining at least one correlation coefficient (fig. 1, ref. 149; col. 5, line 65-col. 6, line 6) comprises determining at least one correlation between received signals. The correlation coefficient α is utilized to determine the adaptive beamforming weights among

transmission signals (fig. 5, refs. 72 and 74). Further, because traffic channel data is received and measurements and calculations are performed on the received signals and the channel data (col. 4, lines 28-38) to determine the correlation coefficient (col. 5, line 65-col. 6, line 6), Harrison discloses that the determination of the correlation coefficient is determined according to at least one correlation between received signals.

Regarding claim 6, Harrison discloses the limitations of claim 1 as applied above. Further, Harrison discloses that the step of selecting at least one of orthogonal coding or beamforming comprises selecting a proportion of orthogonal coding relative to a proportion of beamforming of the transmitting signals (col. 8, lines 4-35).

Regarding claim 7, Harrison discloses the limitations of claim 6 as applied above. Further, Harrison discloses that the at least one correlation coefficient varies between a first level and a second level (col. 7, lines 59-61).

Regarding claim 13, Harrison discloses the limitations of claim 7 as applied above. Further, Harrison discloses that the at least one correlation coefficient being substantially equal to the first level results in selecting beamforming for transmitting and wherein the at least one correlation coefficient being substantially equal to the second level results in selection orthogonal coding for transmitting (col. 8, lines 4-35).

Regarding claim 8, Harrison discloses the limitations of claim 13 as applied above. Further, Harrison discloses that the at least one correlation coefficient having a level between the first and second levels results in selecting both beamforming and orthogonal coding for transmitting (col. 8, lines 22-35).

Regarding claim 9, Harrison discloses the limitations of claim 13 as applied above. Further, Harrison discloses that the at least one correlation coefficient determines the proportion of beamforming relative to orthogonal coding used for transmitting (col. 8, lines 4-35).

Regarding claim 10, Harrison discloses the limitations of claim 9 as applied above. Further, Harrison discloses that the at least one correlation coefficient being at a level that is closer to the first level results in transmitting more beamforming than orthogonal coding (col. 8, lines 4-35).

Regarding claim 11, Harrison discloses the limitations of claim 9 as applied above. Further, Harrison discloses that the at least one correlation coefficient being at a level that is closer to the second level results in transmitting using more orthogonal than beamforming (col. 8, lines 4-35).

Regarding claim 12, Harrison discloses the limitations of claim 9 as applied above. Further, Harrison discloses that the at least one correlation coefficient relative to the first and second reference levels determines the relative amounts of beamforming relative to orthogonal coding used for transmitting (col. 8, lines 4-35).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrison in view of Forssen et al (US 6173014; hereafter "Forssen").

Regarding claim 3, Harrison discloses the limitations of claim 1 as applied above. Harrison discloses determining at least one correlation coefficient, but does not disclose that the step of determining at least one correlation coefficient comprises determining at least one phase correlation coefficient. The correlation coefficient of Harrison, α , is used to control the relative amount of beamforming to orthogonal coding used in the transmission (col. 8, lines 4-35). It is purely a real value having amplitude but not phase correspondence. However, one skilled in the art is familiar with adaptive beamforming and the use of phase adjustments applied to signals for the various antenna facets used in the transmission of a beamformed signal. Forssen teaches an adaptive beamforming system (fig. 4). Forssen also discloses that various phase shifts are made to the signals being applied to the various antenna facets to create a beam (col. 5, line 60-col. 6, line 17; col. 6, lines 4-6). Thereby, with the use of amplitude *and* phase information applied to the various signals transmitted to create a beam, the downlink carrier-to-interference ratio is improved. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to determine a phase correlation coefficient as taught by Forssen in the method of Harrison because the phase information can be advantageously utilized to create the adaptive beam which results in a lower carrier-to-interference ratio on the downlink.

Regarding claim 4, Harrison in view of Forssen disclose the limitations of claim 3 as applied above. Further, it is inherent that the at least one phase correlation

coefficient α of figure 5 is estimated because it is generated from the channel feedback (fig. 1, ref. 149; col. 5, line 65-col. 6, line 6).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jason M. Perilla
February 28, 2005

jmp



CHIEH M. FAN
PRIMARY EXAMINER